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PTO/SB/08A (10-96)

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## **INFORMATION DISCLOSURE STATEMENT BY APPLICANT**

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Sheet 1 of 12

**Complete if Known**

Application Number	09/693,012
Filing Date	10/19/2000
First Named Inventor	Boyers
Group Art Unit	1746
Examiner Name	

Sheet 1 of 12

Attorney Docket Number 101900

## U.S. PATENT DOCUMENTS

## FOREIGN PATENT DOCUMENTS

Examiner Initials <sup>1</sup>	Cite No. <sup>1</sup>	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Office <sup>3</sup>	Number <sup>4</sup>	Kind Code <sup>5</sup> (if known)			
GW	A8	WO	98/42013		Oikari	09/24/1998	10
	A9	WO	99/21798		Nelson et al.	05/06/1999	1
	A10	WO	99/50898		Carter et al.	10/07/1999	19
	A11	WO	99/52654		Bergman et al.	10/21/1999	11
	A12	EP	0867924	A2	De Gendt et al	09/30/1998	31
	A13	EP	0994505	A2	Morita et al	04/19/2000	10
	A14	WO	10/07177	A1	Bergman	02/01/2001	14
*	A15	JP	058496	A2	Takashi <i>Abstract only*</i>	02/25/2000	

Examiner  
Signature

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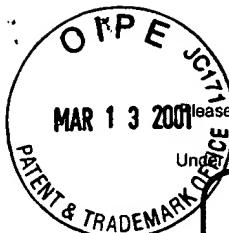
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2 of 12

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Application Number	09/693,012
Filing Date	10/19/2000
First Named Inventor	Boyers
Group Art Unit	1746
Examiner Name	

Attorney Docket Number 101900

### OTHER PRIOR ART -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
GW	B1	BERGMAN, E.; Castle, H.; Melli, M.; Magrin, M. "Photoresist Strip Process Using Ozone Diffusion Through a Controlled Aqueous Boundary Layer," Electronic Meeting Abstract of paper to be presented at Sixth International Symposium on Cleaning Technology in Semiconductor Device Manufacturing at the 1999 Joint International Meeting of the Electrochemical Society in Honolulu, Hawaii; July 1, 1999.	
GW	B2	BERGMAN, E.; Melli, M.; Magrin, M. "Photoresist Strip Process Using Ozone Diffusion Through a Controlled Aqueous Boundary Layer," presented on October 20th at the Sixth International Symposium on Cleaning Technology in Semiconductor Device Manufacturing at the 1999 Joint International Meeting of the Electrochemical Society in Honolulu, Hawaii, Published in Cleaning Technology in Semiconductor Device Manufacturing VI, R.E. Novak, J. Ruzyllo, and T. Hattori, Editors, The Electrochemical Society Proceedings Series, Vol. 99-36, Pennington, NJ, May 23, 2000, pp. 399-406	
GW	B3	BUTTERBAUGH, J.W.; Olson, E.D. "Silicon Critical Cleaning with Ozone, HF, and HCl in a Spray Acid Processor," Electronic Meeting Abstract of paper to be presented at Sixth International Symposium on Cleaning Technology in Semiconductor Device Manufacturing at the 1999 Joint International Meeting of the Electrochemical Society in Honolulu, Hawaii; July 1, 1999.	
GW	B4	BUTTERBAUGH, J.W.; Olson, E.D. "Silicon Critical Cleaning with Ozone, HF, and HCl in a Spray Acid Processor," presented on October 20th at the Sixth International Symposium on Cleaning Technology in Semiconductor Device Manufacturing at the 1999 Joint International Meeting of the Electrochemical Society in Honolulu, Hawaii, Published in Cleaning Technology in Semiconductor Device Manufacturing VI, R.E. Novak, J. Ruzyllo, and T. Hattori, Editors, The Electrochemical Society Proceedings Series, Vol. 99-36, Pennington, NJ, May 23, 2000, pp. 31-36.	

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<i>W</i>	B5	CHOOI, S.Y.M.; Ee, P.Y.; Sih, V.K.T.; and Zhou, M.S.; Bergman, E. J., "Application of Ozonated Aqueous Solutions to Photoresist Strip and Ash Residue Removal Following Plasma Polysilicon Etch." <u>Electronic Meeting Abstract of paper to be presented at Sixth International Symposium on Cleaning Technology in Semiconductor Device Manufacturing at the 1999 Joint International Meeting of the Electrochemical Society in Honolulu, Hawaii; July 1, 1999.</u>	
<i>SN</i>	B6	CHOOI, S.Y.M.; Ee, P.Y.; Sih, V.K.T.; and Zhou, M.S.; Bergman, E. J., "Application of Ozonated Aqueous Solutions to Photoresist Strip and Ash Residue Removal Following Plasma Polysilicon Etch." <u>presented on October 20th at the Sixth International Symposium on Cleaning Technology in Semiconductor Device Manufacturing at the 1999 Joint International Meeting of the Electrochemical Society in Honolulu, Hawaii, Published in Cleaning Technology in Semiconductor Device Manufacturing VI, R.E. Novak, J. Ruzyllo, and T. Hattori, Editors, The Electrochemical Society Proceedings Series, Vol. 99-36, Pennington, NJ, May 23, 2000, pp.212-218.</u>	
<i>SN</i>	B7	CHRISTENSON, K.; Nelson, S., Olim, M., Nelson, G. "Mass Transfer in DIO <sub>3</sub> Resist Stripping", <u>Electrochemical Society Proceedings, Proceedings of the Fifth International Symposium on Cleaning Technology in Semiconductor Device Manufacturing, vol. 97-35, p. 480-487, 1997</u>	
<i>SN</i>	B8	CHRISTENSON, K.; Nelson, S.; Fussy, M. "Optimizing a Hot DIO <sub>3</sub> Resist Strip Process," <u>Electronic Meeting Abstract of paper to be presented at Sixth International Symposium on Cleaning Technology in Semiconductor Device Manufacturing at the 1999 Joint International Meeting of the Electrochemical Society in Honolulu, Hawaii; July 1, 1999.</u>	
			TC 700 MAIL MAR 19 RECEIVED
Examiner Signature	<i>S. Boyers</i>	Date Considered 6/7/02	6/7/02

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<i>Q</i>	B9	CHRISTENSON, K.; "Rinsing: A Critical Process in Contamination Removal", Journal of the Institute of Environmental Sciences, vol. 40, no. 5, Sep-Oct 1997, Institute of Environmental Sciences, Mount Prospect, Illinois, USA, p.45-50. (ref. # 42)
<i>Q</i>	B10	CHRISTENSON, Kurt K.; Nelson, Steve; Olim, Moshe; Nelson, Greg, "Deionized water helps remove water stripping 'resist'-ance", Source: Precision Cleaning v 6 n 4 Apr 1998 Witter Publ Co. p 10, 12, 14-16, 19
<i>Q</i>	B11	DAX, M., "Acid-Free Process Removes Photoresist", Semiconductor International, Oct. 1996, p. 74 (ref. # 43)
<i>Q</i>	B12	DE GENDT, S.; Lux, M.; Claes, M.; Jassal, A.S.; Van Hoeymissen, J.; Lagrange, S.; Bergman, E.; Mertens, P.W.; and Heyns, M. M. "Evaluation of Ozonated Water Spray for Resist Cleaning Applications," Electronic Meeting Abstract of paper to be presented at Sixth International Symposium on Cleaning Technology in Semiconductor Device Manufacturing at the 1999 Joint International Meeting of the Electrochemical Society in Honolulu, Hawaii; July 1, 1999.
<i>Q</i>	B13	DE GENDT, S.; Lux, M.; Claes, M.; Jassal, A.S.; Van Hoeymissen, J.; Lagrange, S.; Bergman, E.; Mertens, P.W.; and Heyns, M. M. "Evaluation of Ozonated Water Spray for Resist Cleaning Applications," presented on October 20th at the Sixth International Symposium on Cleaning Technology in Semiconductor Device Manufacturing at the 1999 Joint International Meeting of the Electrochemical Society in Honolulu, Hawaii,
<i>Q</i>		Published in Cleaning Technology in Semiconductor Device Manufacturing VI, R.E. Novak, J. Ruzyllo, and T. Hattori, Editors, The Electrochemical Society Proceedings Series, Vol. 99-36, Pennington, NJ, May 23, 2000, pp. 391-398

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9/7/02

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Sheet

5 of 12

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Application Number	09/693,012
Filing Date	10/19/2000
First Named Inventor	Boyers
Group Art Unit	1746
Examiner Name	

Attorney Docket Number 101900

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CJ	B14	DE GENDT, S.; Snee, P.; Cornelissen, I.; Lux, M.; Vos, R.; Mertens, P.; Knotter, K.; Heyns, M. "A Novel Resist and Post-Etch Residue Removal Process Using Ozonated Chemistries", Symp. on VLSI Technology digest of Technical Papers, p. 168-169, 1998.	
	B15	DE GENDT, S.; Wauters, J.; Heyns, M. "A Novel Resist and Post-Etch Residue Removal Process Using Ozonated Chemistry," Solid State Technology, p. 57, December, 1998.	
	B16	HATTORI, T. "Environmentally Friendly Single-Wafer Spin Cleaning," Solid State Technology, November 1999, pp. 73-80.	
	B17	HEYNS, M.; Mertens, P.W.; Ruzyllo, J.; Lee, Y.M. "Advanced Wet and Dry Cleaning Coming Together for Next Generation," Solid State Technology, pp. 37-47, March 1999.	
	B18	KASHKOUSH, I.; Novak, R.; Matthews, R.; Lamarra, M. "An Alternative to Conventional Post-Ash Resist Stripping", Future Fab International, Summer 1997, p. 11-20.	
	B19	KASHKOUSH, I.; Matthews, R.; Novak, R. "Photoresist Stripping Using Ozone/Deionized Water Chemistry", Materials Research Society Symposium Proceedings Science and Technology of Semiconductor Surface Preparation	TC 170 MAR 9
		Proceedings of the 1997 MRS Spring Meeting Apr 1-3 1997 v 477 1997 San Francisco, CA, USA Sponsored by: MRS Warrendale PA USA p 21-26.	RECEIVED MAIL
	B20	KLEEMEIER, W.; Leon, V.; Graham, S., "Plasma etch residue and photoresist removal utilizing environmentally benign process chemicals", Source: Diffusion and Defect Data Pt.B: Solid State Phenomena v 65-66 Sep 21-23 1998 1999 Sponsored by: Ashland Chemical, ASTeX, Atomika Instruments, Cascade Scientific, et al Scitec Publ Ltd. p 143-152	61
	B21	KUBO, K.; Ojima, S.; Sakata, Y.; Kato, M.; Toda, M.; Ohmi, T. "The Impact of Radical Activated Ultra Pure Water", Annual Semiconductor Pure Water and Chemicals Conference Proceedings, Proceedings of 1996 15th Annual Semiconductor Pure Water and Chemicals Conference, Ultrapure Water & Chemical Sessions, 1996, Wafer Cleaning Session, Santa Clara, CA, USA, p. 196-214.	

Examiner Signature		Date Considered	6/7/02
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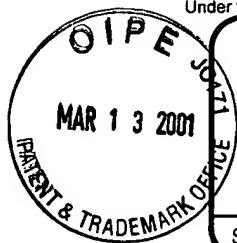
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<i>Con</i>	B22	LACASSE, S.; Leon, V.; "Integrated Aqueous/Ozone Process for Plasma Etch Residue And Photoresist Removal," Electronic Meeting Abstract of paper to be presented at Sixth International Symposium on Cleaning Technology in Semiconductor Device
		Manufacturing at the 1999 Joint International Meeting of the Electrochemical Society in Honolulu, Hawaii; July 1, 1999.
	B23	LACASSE, S.; Leon, V.; "Integrated Aqueous/Ozone Process for Plasma Etch Residue And Photoresist Removal," presented on October 20th at the Sixth International Symposium on Cleaning Technology in Semiconductor Device
		Manufacturing at the 1999 Joint International Meeting of the Electrochemical Society in Honolulu, Hawaii, Published in Cleaning Technology in Semiconductor Device Manufacturing VI, R.E. Novak, J. Ruzyllo, and T. Hattori, Editors, The Electrochemical Society Proceedings Series, Vol. 99-36, Pennington, NJ, May 23, 2000, pp.197-203
	B24	LESTER, M., "Ozone-Water Process Removes Back-End Post-Etch Resist/Residue," Semiconductor International, vol. 23, No. 10, pp. 64 September, 2000.
	B25	MA, S.; Parker, R.; Kavari, R.; Leal, I.; Boyers, D.G.; and Cremer, J.T., "Evaluation of a New Ozone-Water Process for Backend Post-Metal Etch or Post-Oxide Etch Resist or Residue Removal," Proc. Semiconductor Pure Water and Chemicals Conference, pp360-386, March 2000, Santa Clara, CA.
<i>↓</i>	B26	MA, S.; Parker, R.; Kavari, R.; Leal, I.; Boyers, D.G.; and Cremer, J.T., "An Evaluation of the HotOzone™ Process: A New Post Etch Resist and Residue Removal Process," Proc. International Interconnect Technology Conference, pp. 46-48, June 2000, San Francisco, CA.

Examiner Signature	<i>Suzanne L. Boyers</i>	Date Considered	6/7/02
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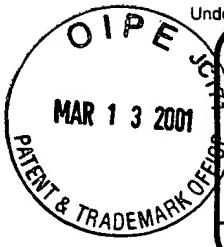
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<i>SW</i>	B27	MATTHEWS, R. "A New Aqueous Based Technology Employing Subambient Temperature Deionized Water and Ozone for Removing Organics", Annual Semiconductor Pure Water and Chemicals Conference Proceedings, Proceedings of 1998 17th Annual Semiconductor Pure Water and Chemicals Conference, Ultrapure Water & Chemical Sessions, March 2-6 1998, Wafer Cleaning Session, Santa Clara, CA, USA, p. 359-374	
<i>SW</i>	B28	MORITA, M.; Kim, J.; Ohmi, T., "Cleaning of Noble Metals on Silicon Wafer Surface by Ozonized Ultra Pure Water", Annual Semiconductor Pure Water and Chemicals Conference Proceedings, Proceedings of 1996 15th Annual Semiconductor Pure Water and Chemicals Conference, Ultrapure Water & Chemical Sessions, 1996, Wafer	
<i>SW</i>	B29	NARAYANSWAMI, N.; Nelson, S. "Dynamics of Mass Transfer on a Wafer Surface in Ozonated Water Processing for Photoresist Removal," presented at the Ultra Clean Processing for Silicon Surfaces Meeting, Belgium, September 21-23, 1998.	
	B30	NELSON, S. "Ozonated Water for Photoresist Removal, Solid State Technology, July 1999, pp.107-112.	
		Reprint of B15 was provided	
<i>SW</i>	B31	NELSON, S. "Using an Ozone Water Last Cleaning Process to Research the Effects of Process Parameters on Wafer Contamination", Annual Semiconductor Pure Water and Chemicals Conference Proceedings, Proceedings of 1996 15th Annual Semiconductor Pure Water and Chemicals Conference, Ultrapure Water & Chemical Sessions, 1996, Wafer Cleaning Session, Santa Clara, CA, USA, p. 230-242.	
<i>SW</i>	B32	NELSON, S.; Christenson, K. "The Effect of Temperature on an Ozonated Water Photoresist Strip Process," presented on October 20th at the Sixth International Symposium on Cleaning Technology in Semiconductor Device Manufacturing at the 1999 Joint International Meeting of the Electrochemical Society in Honolulu, Hawaii, Published in Cleaning Technology in Semiconductor Device Manufacturing VI, R.E. Novak., J. Ruzyllo, and T. Hattori, Editors, The Electrochemical Society Proceedings Series, Vol. 99-36, Pennington, NJ, May 23, 2000., pp. 189-196.	
			SEARCHED INDEXED SERIALIZED FILED JUN 19 2002 U.S. PATENT AND TRADEMARK OFFICE
Examiner Signature	<i>S. Hallinan</i>		Date Considered 6/7/02

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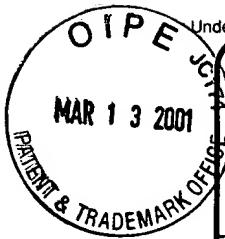
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CW	B33	NELSON, S.L.; Carter, L.E., "Process using ozonated water solutions to remove photoresist after metallization" Diffusion and Defect Data Pt.B: Solid State Phenomena v 65-66 Sep 21-23 1998 1999 Sponsored by: Ashland Chemical; ASTeX; Atomika Instruments; Cascade Scientific; et al Scitec Publ Ltd. p 287-290.	
	B34	OHMI, T. "Total Room Temperature Wet Cleaning for Si Substrate Surface, J. Electrochem. Society, Vol. 143, No. 9, September. 1996, pp. 2957-2964.	
	B35	OHMI, T. "Total Room Temperature Wet Cleaning of Silicon Surfaces," Semiconductor International, July 1996, pp. 323-338.	
	B36	OHMI, T.; Isagawa, T.; Kogure, M.; Imaoka, T. "Native Oxide Growth and Organic Impurity Removal on Si Surface with Ozone-Injected Ultra-pure Water, J. Electrochem. Society, Vol. 140, No. 3, March 1993, pp. 804-810.	
	B37	WEI, J.; Verhaverbake, S.; Parker, J. "Ozone Use for Post-ashing Resist Stripping: Mechanisms and Recent Findings", Annual Semiconductor Pure Water and Chemicals Conference Proceedings, Proceedings of 1997 16th Annual Semiconductor Pure Water and Chemicals Conference, Part 2, March 3-7 1997, vol. II Chemical Session, 1997 Santa Clara, CA, USA, p. 81-98	
	B38	WOLKE, K.; Riedel, T.; Huag, R.; De Gendt, S.; Heyns, M. M. ; Meuris, M., "Application of Moist Ozone Gas Phase for Removal of Resist and Organic Contamination in a Novel Tank Type Processor", presented on October 20th at the Sixth International Symposium on Cleaning Technology in Semiconductor Device Manufacturing at the 1999 Joint International Meeting of the Electrochemical Society in Honolulu, Hawaii, Published in Cleaning Technology in Semiconductor Device Manufacturing VI, R.E. Novak, J. Ruzyllo, and T. Haftori, Editors, The Electrochemical Society Proceedings Series, Vol. 99-36, Pennington, NJ, May 23, 2000, pp.205-211.	

Examiner Signature	<i>Santellus</i>	Date Considered	6/7/02
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Sheet 9 of 12

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<b>Application Number</b>	09/693,012
<b>Filing Date</b>	10/19/2000
<b>First Named Inventor</b>	Boyers
<b>Group Art Unit</b>	1746
<b>Examiner Name</b>	

Attorney Docket Number 101900

## U.S. PATENT DOCUMENTS

## FOREIGN PATENT DOCUMENTS

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Sheet

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Application Number	09/693,012
Filing Date	10/19/2000
First Named Inventor	Boyers
Group Art Unit	1746
Examiner Name	

Attorney Docket Number 101900

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GP	D1	ADLER, G. A. ; Hill, G. R., "Kinetics and Mechanism of Hydroxide Ion Catalyzed Ozone Decomposition in Aqueous Solution," J. Am. Chem. Soc. vol. 72, 1950, pp. 1984.	
	D2	FORNI, L.; Bahnemann, D. Hart, E.J., "Mechanism of the Hydroxide Ion Initiated Decomposition of Ozone in Aqueous Solution, J. Phys. Chem. vol. 86, pp 255-259, 1982.	
	D3	GROVE, A. S., Physics and Technology of Semiconductor Devices, John Wiley and Sons, 1967., pp. 10-18.	
	D4	HOIGNE, J. and Bader, H. "The Role of Hydroxyl Radical Reactions in Ozonation Processes in Aqueous Solutions", Water Research, Vol. 10, pp. 377-388, Pergamon Press 1976.	
	D5	HOIGNE, J. and Bader, H. "Rate Constants of direct reactions of ozone with organic and inorganic compounds in water. I. Non-dissociating organic compounds, Water Research, vol. 17, pp. 173-184, pp. 185-194, 1983.	
	D6	HOIGNE, J. and Bader, H. "Rate Constants of direct reactions of ozone with organic and inorganic compounds in water. II Dissociating Organic Compounds, Water Research, vol. 17, pp. 185-194, 1983.	
	D7	HOIGNE, J.; Bader, H.; Haag, W.R.; Staehelin, J., "Rate Constants of Reactions of Ozone with Organic and Inorganic Compounds in Water - III, Water Research Vol. 19, No. 8, pp 993-1004, 1985.	
	D8	SEHESTED, K.; Corfitzen, H.; Holzman, J.; Hart, E. J., "Decomposition of Ozone in Aqueous Acetic Acid Solutions (pH 0-4)," J. Phys. Chem., Vol. 96, 1992, pp. 1005-1009.	
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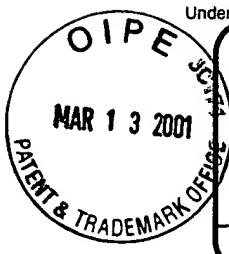
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Application Number	09/693,012
Filing Date	10/19/2000
First Named Inventor	Boyers
Group Art Unit	1746
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Attorney Docket Number	101900

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Sheet

12 of 12

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Application Number	09/693,012
Filing Date	10/19/200
First Named Inventor	Boyers
Group Art Unit	1746
Examiner Name	
Attorney Docket Number	101900

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SW	F1	BROADWATER, W. T.; Hoehn, R.C.; King, P.H. "Sensitivity of Three Selected Bacterial Species to Ozone," Applied Microbiology, 26(3):391-393 (1973).	
	X		
	F2	RICKLOFF, J.R. An Evaluation of the Sporicidal Activity of Ozone, Appl. Environ. Microbiol., 53:683-686 (1987).	
	X		
	F3	WICKRAMANAYAKE, G. B. , Rubin, A.J.; Sproul, O. J., "Inactivation of Naegleria and Giardia cysts in Water by Ozonation", Journal WPCF, vol. 56, No. 8, August, 1984, pp. 983-988.	
	X		
	F4	WICKRAMANAYAKE, G. B. , Sproul, O. J. "Kinetics of the Inactivation of Microorganisms", pp. 72-84, Disinfection, Sterilization, and Preservation, Editor: Seymour S. Block, 4th Edition, Neal and Febiger, Philadelphia, 1991.	
	X		
	F5	WICKRAMANAYAKE, G. B. ; Sproul, O.J., "Ozone Concentration and Temperature Effects on Disinfection Kinetics," Ozone Science and Engineering vol. 10, pp. 123-135, 1988.	
	X		
	F6	WICKRAMANAYAKE, G. B., "Disinfection and Sterilization by Ozone", Chapter 10, pp182-190. Disinfection, Sterilization, and Preservation, Editor: Seymour S. Block, 4th Edition, Neal and Febiger, Philadelphia, 1991.	
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